

# SERVICE MANUAL

XS3632 / C3632, CL3632

**SANYO**

FILE NO.

## SPLIT SYSTEM AIR CONDITIONER

INDOOR MODEL No.	PRODUCT CODE No.	OUTDOOR MODEL No.	PRODUCT CODE No.
XS3632	854 014 51	C3632	854 014 54
		CL3632	854 014 52

Section

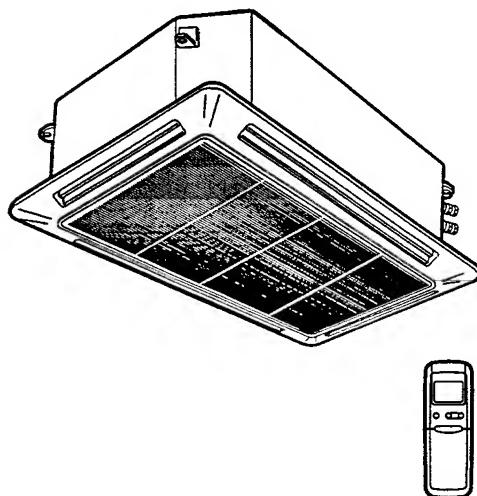
1

2

3

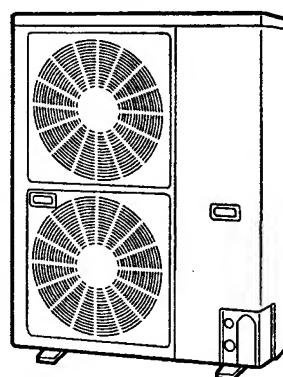
4

Indoor Unit



XS3632

Outdoor Unit



C3632  
CL3632

## Important

### Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

**For safe installation and trouble-free operation, you must :**

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.



#### WARNING

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.



#### CAUTION

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

### If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

### In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

## SPECIAL PRECAUTIONS

### When Wiring



**ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.**

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death**.
- **Ground the unit** following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

### When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

### When Installing

#### ...In a Room

Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

#### ...In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

#### ...In an area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

#### ...In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

### When Connecting Refrigerant Tubing

- Ventilate the room well, in the event that refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of poisonous gas.
- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

#### NOTE

Depending on the system type, liquid and gas lines may be either narrow or wide. Therefore, to avoid confusion the refrigerant tubing for your particular model is specified as either "narrow" or "wide" rather than as "liquid" or "gas".

### When Servicing

- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site when installation is finished. Check that no metal scraps or bits of wiring have been left inside the unit.



#### CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Contact of refrigerant gas with fire or heat can produce poisonous gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of poisonous gas.

# WHO SHOULD USE THIS MANUAL

This service manual is made to assist the service technician apply his knowledge and training to this model air conditioner. This manual is written both for **experienced service persons** and **those who are new** to air conditioning service. To help those with less experience or who are new to this kind of unit we have included more explanations of basic procedures in simple language than is usual in some service manuals. The **experienced technician** will of course find he knows many of these things already and can go directly to the procedures and information he needs; the less experienced technician will better understand what to do even before he arrives on the job, and therefore be better able to work by himself as well as assist the more experienced technician.

## TABLE OF CONTENTS

<b>1. SPECIFICATIONS</b> .....	5
1-1 Unit Specifications .....	6
1-2 Major Component Specifications .....	10
(A) Indoor Unit .....	10
(B) Outdoor Unit .....	11
1-3 Other Component Specifications .....	13
(A) Indoor Unit .....	13
(B) Outdoor Unit .....	14
1-4 Dimensional Data.....	16
(A) Indoor Unit .....	16
(B) Outdoor Unit .....	17
1-5 Refrigerant Flow Diagram .....	18
1-6 Operating Range .....	19
<b>2. PROCESSES AND FUNCTIONS</b> .....	21
2-1 Room Temperature Control .....	22
2-2 Freeze Prevention .....	23
2-3 Drain Pump Control .....	23
2-4 Outdoor Fan Speed Control .....	24
<b>3. ELECTRICAL DATA</b> .....	25
3-1 Indoor Unit .....	26
3-2 Outdoor Unit .....	28
<b>4. SERVICE PROCEDURES</b> .....	33
4-1 Troubleshooting .....	34
4-2 A Sensor is Defective .....	45
4-3 Operation of Major Electrical Parts .....	45
4-4 Checking the Electrical Components .....	46

# Introduction: *Read Me First!*

This manual will help you understand and service the air conditioner. To help you find the information you need, we have divided it into 5 main sections. Each section is divided into chapters with charts, tables and explanations to help you find and repair problems.

- **Section 1: Specifications**, tells you about the physical and electrical make up of the unit, as well as its heating and cooling capacities. Look in this section to find the correct values for components and functions.
- **Section 2: Processes and Functions**, explains each different part of the cooling and heating cycle, and how each control function reacts to changing conditions to keep the room at the set temperature range.
- **Section 3: Electrical Data**, which has fold-out schematic and wiring diagrams so you can find the parts you need to check when something is wrong, and see how they should be connected.
- **Section 4: Service Procedures**, has two main parts, a *diagnostic* chapter to help you find the specific component to replace or adjust, and a chapter with specific procedures and values to guide you in checking the electrical components in the unit.

## HOW TO USE THIS MANUAL

You can use this manual both as a *reference* to find specific information about the capacity, functions and construction of this unit, and as a source of information to help you set up and maintain the unit. When this unit is not working properly, and the cause is not known, you can use the procedures in **Section 3: Servicing Procedures** to find the problem, fix it, and restore the unit to its proper functioning.

This air conditioner has many helpful self diagnostic features to help you identify problem areas quickly.

So you will be ready when a problem happens, we suggest you look this manual over and become familiar with it by following these steps:

1. **Look at the TABLE OF CONTENTS** to get an idea of what is in this manual and where to find it.
2. **Look at the chapter about TROUBLE SHOOTING**, so you are familiar with the way the flow charts work. They are designed to guide you quickly through the possible causes for each kind of problem that is likely to happen to the Unit. Particularly read the introduction to this section, and the parts about the self-diagnosis and error codes which show on the display.
3. **Look at the chapter about CHECKING ELECTRICAL COMPONENTS**. You already know about most of these procedures. This chapter gives you the specific values and methods for these components. If you don't know some of these procedures, you can easily learn them here.
4. **Read the Instruction Manual!** The Instruction Manual is included here because it helps you help the user to set the temperature controls properly and know how to take care of any simple problems that may happen, as well as know when to call for service. The Instruction Manual also has illustrations, care, and installation information not found in the rest of the service manual. It is short, and if you read it carefully, you will be able to answer the customers questions easily, and also know the most efficient ways for setting times and temperatures.

Please use this manual to make your work easier, keep the air conditioner functioning well, and keep your customers satisfied.

# 1. SPECIFICATIONS

1-1	Unit Specifications .....	6
1-2	Major Component Specifications .....	10
	(A) Indoor Unit .....	10
	(B) Outdoor Unit .....	11
1-3	Other Component Specifications .....	13
	(A) Indoor Unit .....	13
	(B) Outdoor Unit .....	14
1-4	Dimensional Data .....	16
	(A) Indoor Unit .....	16
	(B) Outdoor Unit .....	17
1-5	Refrigerant Flow Diagram .....	18
1-6	Operating Range .....	19

## 1-1 Unit Specifications

MODEL No.	Indoor Unit		XS3632			
	Outdoor Unit		C3632			
POWER SOURCE			230 - 208 V / 1 Phase / 60 Hz			
PERFORMANCE			Cooling			
Capacity	BTU / h	36,000	35,000			
	kW	10.55	10.26			
Air circulation (Hi)	cu.ft. / min.	980	880			
Moisture removal (High)	Pints / h	11.9	11.9			
ELECTRICAL RATINGS						
Voltage rating	V	230	208			
Available voltage range	V	187 - 253				
Running amperes*	A	15.4	16.0			
Max. running amperes**	A	18.0	19.3			
Power input	W	3,440	3,250			
Power factor	%	97	98			
S.E.E.R	BTU / Wh	10.8	11.0			
Max. starting amperes	A	97.9	88.8			
Maximum fuse size	A	35				
FEATURES						
Controls	Microprocessor					
Timer	ON / OFF 24-hours & Program					
Fan speed Indoor / Outdoor	3 and Automatic control / 2 (Auto)					
Air deflection	Horizontal / Vertical					
Air filter	Washable, easy access					
Remote controller (Accessory)	RCS - 5PS4U					
Refrigerant control	Capillary tube					
Refrigerant tubing connections	Flare type					
Drain pump / Drain pipe trade size	Max. head 9-27/32 in. above drain connection / 3/4 in. (26.7 mm)					
Compressor	Rotary					
Operation sound	Indoor - Hi / Me / Lo Outdoor - Hi	dB - A dB - A	43 / 40 / 36 56			
REFRIGERANT TUBING						
Limit of tubing length	ft. (m)		165 (50)			
Limit of tubing length at shipment	ft. (m)		50 (15)			
Limit of elevation difference between the two units	ft. (m)		Outdoor unit is higher than indoor unit: 165 (50) Outdoor unit is lower than indoor unit: 100 (30)			
Refrigerant tube outer diameter	Narrow tube Wide tube	in. (mm) in. (mm)	3 / 8 (9.52) 3 / 4 (19.05)			
Refrigerant amount at shipment	lbs. (kg)		R22 : 9.48 (4.3)			

DIMENSIONS & WEIGHT		Indoor unit		Outdoor unit	
Unit dimensions	Height	in. (mm)	11-1/32 (280)	48-5/8 (1,235)	
	Width	in. (mm)	41-11/32 (1,050)	37 (940)	
	Depth	in. (mm)	29-29/32 (760)	13-3/8 (340)	
Net weight		lbs. (kg)	60 (27)	198 (90)	
Indoor grille dimensions	Height	in. (mm)	3-1/16 (78)		
	Width	in. (mm)	45-9/32 (1,150)		
	Depth	in. (mm)	33-27/32 (860)		
Net weight		lbs. (kg)	15 (7)		
Indoor Unit	Height	in. (mm)	12-7/16 (316)	52-7/32 (1,326)	
Package dimensions	Width	in. (mm)	43-27/32 (1,114)	40 (1,016)	
	Depth	in. (mm)	32-25/32 (833)	16-12/32 (416)	
	Shipping weight	lbs. (kg)	71 (32)	223 (101)	
Shipping volume	cu. ft. (m <sup>3</sup> )		10.4 (0.293)	19.8 (0.56)	
	cu. ft. (m <sup>3</sup> )		4.6 (0.131)		
Indoor grille	Height	in. (mm)	4-3/32 (104)		
Package dimensions	Width	in. (mm)	49-1/2 (1,257)		
	Depth	in. (mm)	39-11/32 (999)		
	Shipping weight	lbs. (kg)	29 (13)		
Shipping volume		cu. ft. (m <sup>3</sup> )	4.6 (0.131)		

DATA SUBJECT TO CHANGE WITHOUT NOTICE

## Cooling :

Rating conditions (\*) : Indoor air temperature 80 °F DB / 67 °F WB, Outdoor air temperature 95 °F DB / 75 °F WB

Full load conditions (\*\*) : Indoor air temperature 80 °F DB / 67 °F WB, Outdoor air temperature 115 °F DB

## 1-1 Unit Specifications

MODEL No.	Indoor Unit		XS3632			
	Outdoor Unit		CL3632			
POWER SOURCE			230 - 208 V / 1 Phase / 60 Hz			
PERFORMANCE			Cooling			
Capacity	BTU / h	36,000	35,000			
	kW	10.55	10.26			
Air circulation (Hi)	cu.ft. / min.	980	880			
Moisture removal (High)	Pints / h	11.9	11.9			
ELECTRICAL RATINGS						
Voltage rating	V	230	208			
Available voltage range	V	187 - 253				
Running amperes*	A	15.4	16.0			
Max. running amperes**	A	18.0	19.3			
Power input	W	3,440	3,250			
Power factor	%	97	98			
S.E.E.R	BTU / Wh	10.8	11.0			
Max. starting amperes	A	97.9	88.8			
Maximum fuse size	A	35				
FEATURES						
Controls	Microprocessor					
Low ambient control	Built-in 0 °F					
Timer	ON / OFF 24-hours & Program					
Fan speed Indoor / Outdoor	3 and Automatic control / 3 (Auto)					
Air deflection	Horizontal / Vertical					
Air filter	Washable, easy access					
Remote controller (Accessory)	RCS - 5PS4U					
Refrigerant control	Capillary tube					
Refrigerant tubing connections	Flare type					
Drain pump / Drain pipe trade size	Max. head 9-27/32 in. above drain connection / 3/4 in. (26.7 mm)					
Compressor	Rotary					
Operation sound	Indoor - Hi / Me / Lo Outdoor - Hi	dB - A dB - A	43 / 40 / 36 56			
REFRIGERANT TUBING						
Limit of tubing length	ft. (m)	165 (50)				
Limit of tubing length at shipment	ft. (m)	50 (15)				
Limit of elevation difference between the two units	ft. (m)	Outdoor unit is higher than indoor unit: 165 (50) Outdoor unit is lower than indoor unit: 100 (30)				
Refrigerant tube outer diameter	Narrow tube Wide tube	in. (mm) in. (mm)	3 / 8 (9.52) 3 / 4 (19.05)			
Refrigerant amount at shipment	lbs. (kg)		R22 : 9.48 (4.3)			

DIMENSIONS & WEIGHT			Indoor unit	Outdoor unit
Unit dimensions	Height	in. (mm)	11-1/32 (280)	48-5/8 (1,235)
	Width	in. (mm)	41-11/32 (1,050)	37 (940)
	Depth	in. (mm)	29-29/32 (760)	13-3/8 (340)
Net weight		lbs. (kg)	60 (27)	198 (90)
Indoor grille dimensions	Height	in. (mm)	3-1/16 (78)	
	Width	in. (mm)	45-9/32 (1,150)	
	Depth	in. (mm)	33-27/32 (860)	
Net weight		lbs. (kg)	15 (7)	
Indoor Unit	Height	in. (mm)	12-7/16 (316)	52-7/32 (1,326)
Package dimensions	Width	in. (mm)	43-27/32 (1,114)	40 (1,016)
	Depth	in. (mm)	32-25/32 (833)	16-12/32 (416)
	Shipping weight		lbs. (kg)	71 (32)
Shipping volume			cu. ft. (m <sup>3</sup> )	223 (101)
			10.4 (0.293)	19.8 (0.56)
Indoor grille	Height	in. (mm)	4-3/32 (104)	
	Width	in. (mm)	49-1/2 (1,257)	
	Depth	in. (mm)	39-11/32 (999)	
Shipping weight	Shipping weight		lbs. (kg)	29 (13)
			cu. ft. (m <sup>3</sup> )	4.6 (0.131)

DATA SUBJECT TO CHANGE WITHOUT NOTICE

Cooling :

Rating conditions (\*) : Indoor air temperature 80 °F DB / 67 °F WB, Outdoor air temperature 95 °F DB / 75 °F WB  
 Full load conditions (\*\*) : Indoor air temperature 80 °F DB / 67 °F WB, Outdoor air temperature 115 °F DB

## 1-2 Major Component Specifications

## (A) Indoor Unit

MODEL No.	XS3632				
Source	230 - 208 V / 1 phase / 60 Hz				
Remote controller (Accessory)	RCS - 5PS4U				
Controller P. C. B Ass'y	CR - TS2432				
Control circuit fuse	250 V, 3 A				
Switch Ass'y	SW - X363GS				
Fan (Number ... diameter)	in. (mm)	Turbo (1...19-9/32 (490))			
Fan motor					
Model	SFG6X - 61A3P				
Source	230 - 208 V / 1 phase / 60 Hz				
No. of pole ... r.p.m. (230 V, High)	rpm	6 ... 560			
Nominal output	W	60			
Coil resistance (Ambient temperature 68 °F)	Ω	BRW - WHT : 71.1 , ORG - YEL : 22.7 WHT - VLT : 8.7 , VLT - PNK : 43.2 VLT - ORG : 13.3 , YEL - BLK : 54.32			
Safety device					
Operating temperature	Open °F	266 ± 14.4			
	Close °F	174.2 ± 27			
Run capacitor	VAC, µF	440 V, 6 µF			
Heat exchanger					
Coil	Aluminum plate fin / Copper tube				
Rows ... Fins per inch	2 ... 14.9				
Face area	ft. <sup>2</sup> (m <sup>2</sup> )	5.17 (0.48)			
Panel					
Model No.	PNR - XS3632				
Indicator Lamp Ass'y	IND - XS3632				
Auto louver motor	MT8 - 3C				
Auto louver motor ... Rated	V, W, rpm	240 VAC, 3 W, 3 rpm			
Coil resistance (Ambient temperature 77 °F)	Ω	16,430 Ω ± 8 %			

DATA SUBJECT TO CHANGE WITHOUT NOTICE

## 1-2 Major Component Specifications

## (B) Outdoor Unit

MODEL No.		C3632	
Source		230 - 208 V / 1 phase / 60 Hz	
Compressor		Rotary (Hermetic)	
Model		C - R221H6R	
Source		230 - 208 V / 1 phase / 60 Hz	
Nominal output	W	2,200	
Compressor oil	cc	1,500	
Coil resistance (Ambient temperature 77 °F)	Ω	C - R : 0.549 , C - S : 1.525	
Safety device		Internal type	
Overload relay models		—	
Operating temperature	Open °F	320 ± 9	
	Close °F	189 ± 20	
Operating ampere (at 77 °F)	A	—	
Run capacitor	VAC, μF	400 V, 40 μF	
Refrigerant amount charged at shipment	lbs. (kg)	R22 : 9.48 (4.3)	
High pressure switch		ACB - 1UB11	
Set pressure	OFF kg/cm²	30 ± 2.0	
	ON kg/cm²	24 ± 2.0	
Fan		Propeller	
Number...diameter	in. (mm)	2 ... 18-3/32 (460)	
Fan speeds		2 (AUTO)	
Fan motor			
Model		KFC6T - 91D6P × 2	
Source		230 - 208 V / 1 phase / 60 Hz	
No. of pole ... rpm (230 V, High)	rpm	6 ... 879	
Nominal output	W	110 × 2	
Coil resistance (Ambient temperature 68 °F)	Ω	BRW - WHT : 67.14 , VLT - YEL : 11.42 WHT - VLT : 64.85 , YEL - PNK : 10.60	
Safety device			
Operating temperature	Open °F	248 ± 9	
	Close °F	171 ± 27	
Run capacitor	VAC, μF	440 V, 4 μF × 2	
Heat exchanger			
Coil		Aluminum plate fin / Copper tube	
Rows ... Fins per inch		2 ... 12.7	
Face area	ft.² (m²)	11.63 (1.08)	

DATA SUBJECT TO CHANGE WITHOUT NOTICE

## 1-2 Major Component Specifications

## (B) Outdoor Unit

MODEL No.	CL3632				
Source	230 - 208 V / 1 phase / 60 Hz				
Controller P.C.B. Ass'y	CR - CL2432 (Microprocessor)				
Control circuit fuse	250 V, 3 A				
Compressor	Rotary (Hermetic)				
Model	C - R221H6R				
Source	230 - 208 V / 1 phase / 60 Hz				
Nominal output	W	2,200			
Compressor oil	cc	1,500			
Coil resistance (Ambient temperature 77 °F)	Ω	C - R : 0.549, C - S : 1.525			
Safety device	Internal type				
Overload relay models	—				
Operating temperature	Open °F	320 ± 9			
	Close °F	189 ± 20			
Operating ampere (at 77 °F)	A	—			
Run capacitor	VAC, μF	400 V, 40 μF			
Crank case heater	V, W	230 V, 30 W			
Refrigerant amount charged at shipment	lbs. (kg)	R22 : 9.48 (4.3)			
High pressure switch	ACB - 1UB11				
Set pressure	OFF kg/cm²	30 ± 2.0			
	ON kg/cm²	24 ± 2.0			
Fan	Propeller				
Number...diameter	in. (mm)	2 ... 18 - 3/32 (460)			
Fan speeds	3 (AUTO)				
Fan motor					
Model	KFC6T - 91D6P × 2				
Source	230 - 208 V / 1 phase / 60 Hz				
No. of pole .... rpm (230 V, High)	6 ... 879				
Nominal output	W	110 × 2			
Coil resistance (Ambient temperature 68 °F)	Ω	BRN - WHT : 67.14, VLT - YEL : 11.42 WHT - VLT : 64.85, YEL - PNK : 10.60			
Safety device	Internal type				
Operating temperature	Open °F	248 ± 9			
	Close °F	171 ± 27			
Run capacitor	VAC, μF	440 V, 4 μF × 2			
Heat exchange					
Coil	Aluminum plate fin / Copper tube				
Rows .... Fins per inch	2 ... 12.7				
Face area	ft.² (m²)	11.63 (1.08)			

DATA SUBJECT TO CHANGE WITHOUT NOTICE

## 1-3 Other Component Specifications

## (A) Indoor Unit

MODEL No.		XS3632		
Power Transformer		ATR - I104A		
Rated	Primary	AC 220 V, 60 Hz		
	Secondary	10.6 V, 0.93 A		
	Capacity	9.85 VAC		
Coil resistance (Ambient temperature 77 °F)	Ω	WHT - WHT	: 101 , BRN - BRN : 0.42	
Thermistor cut off temperature	°F	266		
Thermistor (Coil sensor)		PBC - 41E - S36		
Coil resistance	kΩ	14 °F : 23.7	, 41 °F : 12.1	
		23 °F : 18.8	, 50 °F : 9.7	
Thermistor (Room or coil sensor)	kΩ	32 °F : 16.5	, 104 °F : 2.7	
		41 °F : 12.8	, 113 °F : 2.2	
		50 °F : 10.0	, 122 °F : 1.8	
		68 °F : 6.3	, 131 °F : 1.5	
		86 °F : 4.0	,	
Drain pump		WP20SL - 21		
Rated		AC 200 V, 14.7 W		
Float switch		FS - 0218 - 103		
MAX Rated (Contact rated)		AC 200 V, 50 W		
Switch Ass'y		SW - X363GS		
Indicator Lamp Ass'y		IND - XS3632		
Synchronized Motor		MT8 - 3C		

DATA SUBJECT TO CHANGE WITHOUT NOTICE

## 1-3 Other Component Specifications

## (B) Outdoor Unit

MODEL No.	C3632	
Compressor Motor Magnetic Contactor	FMCA - 1SUL	
Coil rated	AC 240 V, 60 Hz	
Coil resistance (at 68 °F)	Ω	588 ± 10 %
Contact rated (Main)	AC 240 V, 26 A	
Contact rated (Auxiliary)	AC 240 V, 3 A	
Power Relay	HH62S	
Coil rated	AC 240 V, 60 Hz	
Coil resistance (at 77 °F)	kΩ	17.2
Contact rated	AC 220 V, 5 A	
Thermostat (Coil sensor)	YTB - 4U305F	
Operating Temperature	°F	79 ± 3 OFF 75 ± 3 ON
Contact rated	200 to 240 V, 1 A	
Thermistor (PTC)	TDK - 101YV	
Rated		
Max. voltage	AC 400 V	
Max. ampere	11.5 A	
Resistance (at 77 °F)	Ω	100 ± 30 %

DATA SUBJECT TO CHANGE WITHOUT NOTICE

## 1-3 Other Component Specifications

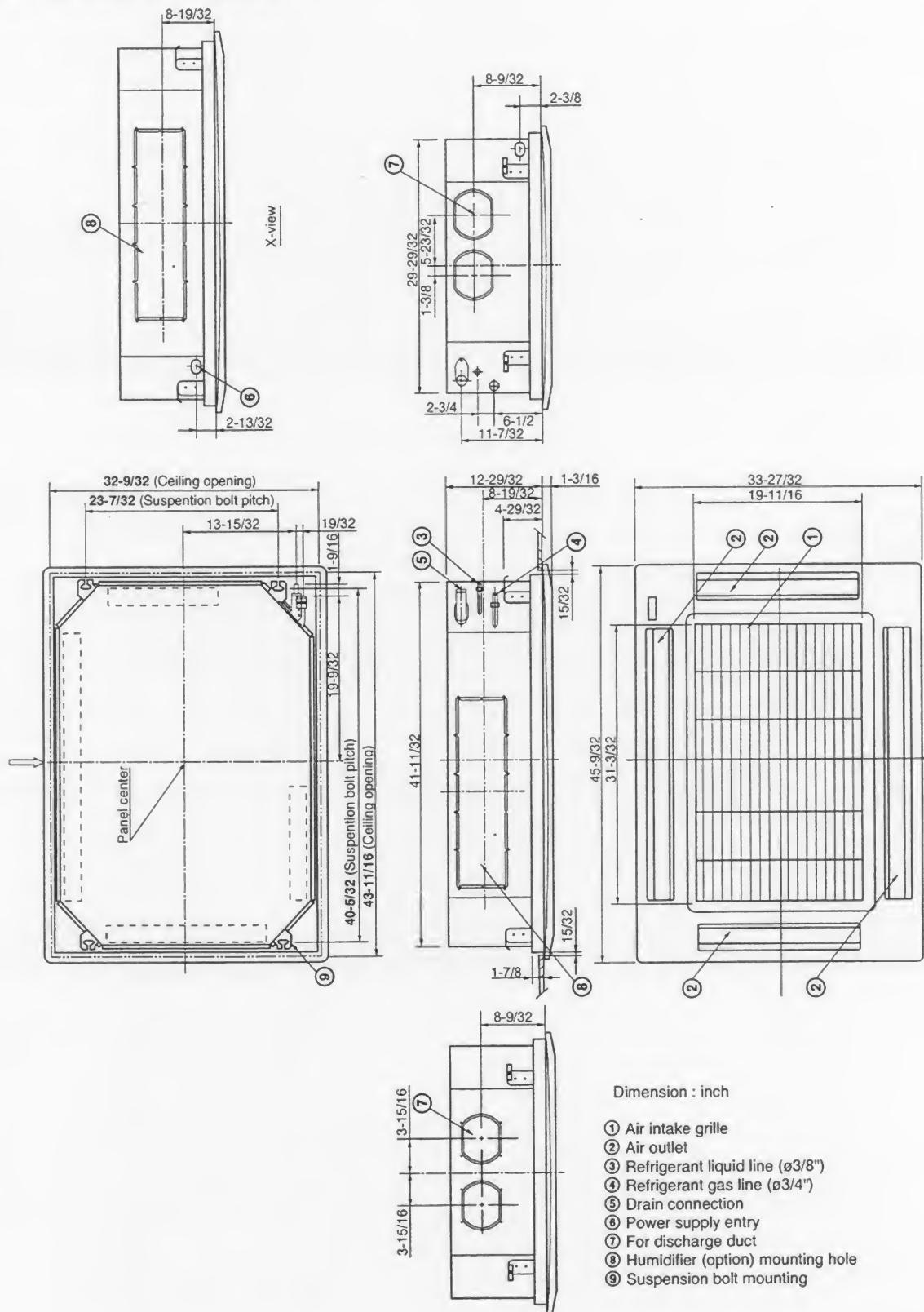
## (B) Outdoor Unit

MODEL No.		CL3632
Compressor Motor Magnetic Contactor		FMCA - 1SUL
Coil rated		AC 240 V, 60 Hz
Coil resistance (at 68 °F)	Ω	588 ± 10 %
Contact rated (Main)		AC 240 V, 26 A
Contact rated (Auxiliary)		AC 240 V, 3 A
Power Relay		HH62S
Coil rated		AC 240 V, 60 Hz
Coil resistance (at 77 °F)	kΩ	17.2
Contact rated		AC 220 V, 5 A
Power Transformer		ATR - I35B
Rated		
Primary		AC 220 V, 60 Hz
Secondary		14 V, 0.2 A
Capacity		2.8 VAC
Coil resistance (at 78 °F)	Ω	WHT - WHT : 482.5, BRN - BRN : 3.95
Thermal cut off temperature	°F	266
Thermistor (Outdoor Temp. sensor)		PBC - 41E - S4
Coil resistance	kΩ	14 °F : 23.7, 50 °F : 9.7 23 °F : 18.8, 68 °F : 6.5 32 °F : 15.0, 86 °F : 4.4 41 °F : 12.1, 104 °F : 3.1 113 °F : 2.6
Thermistor (PTC)		TDK - 101YV
Rated		
Max. voltage		AC 400 V
Max. ampere		11.5 A
Resistance (at 77 °F)	Ω	100 $^{+30}_{-20}$ %

DATA SUBJECT TO CHANGE WITHOUT NOTICE

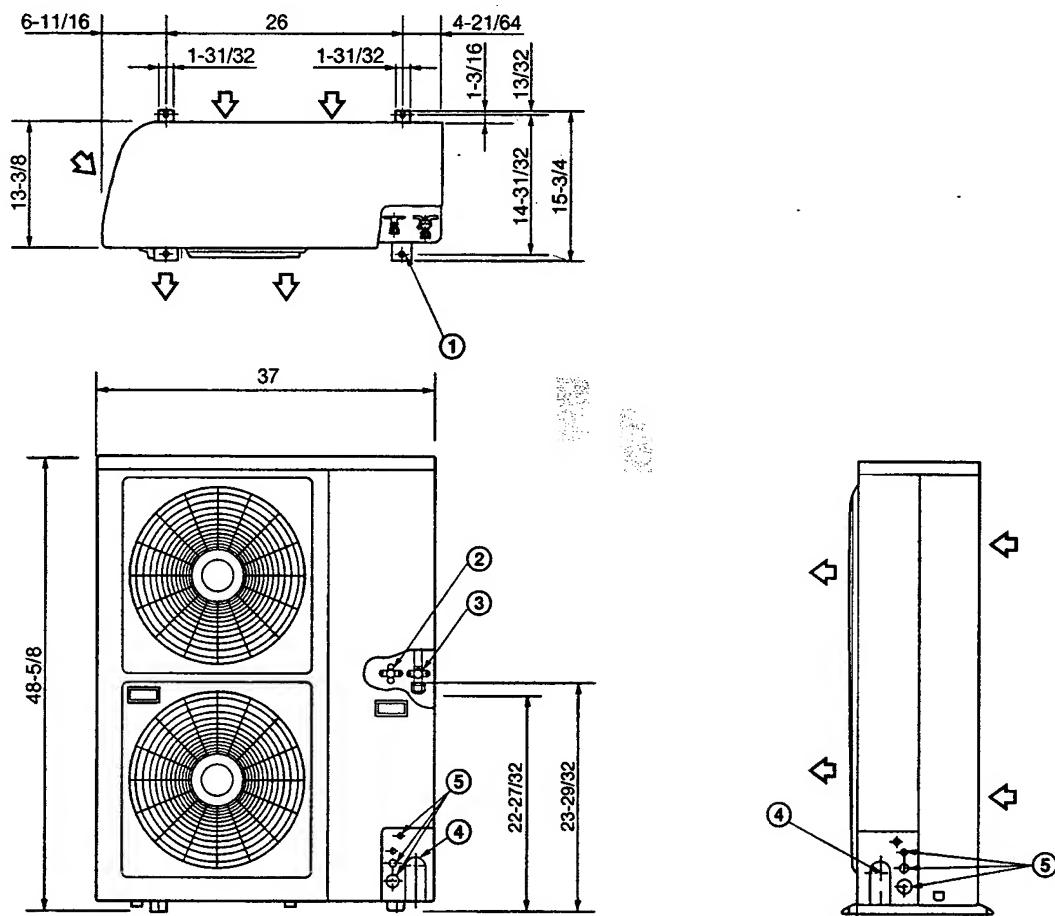
## 1-4 Dimensional Data

## (A) Indoor Unit: XS3632



## 1-4 Dimensional Data

## (B) Outdoor Unit: C3632, CL3632



Dimension : inch

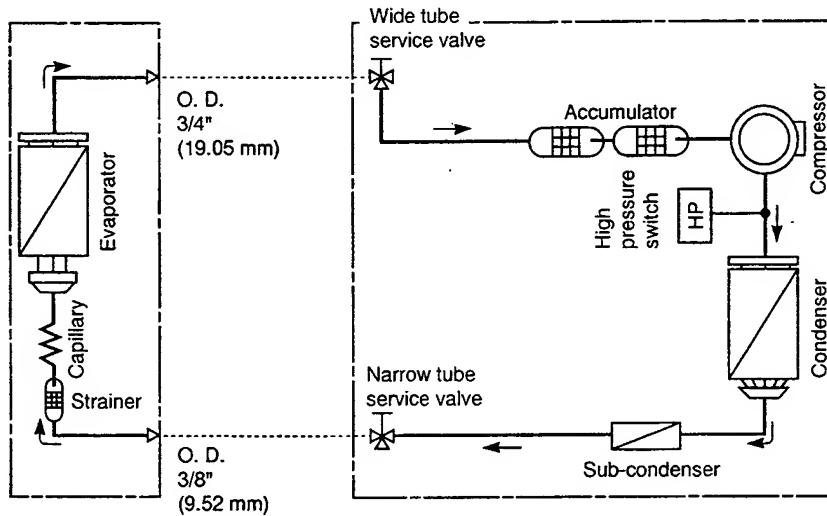
- ① Hole for anchor bolt (4-ø13)
- ② Refrigerant tube joint (narrow tube)  
Flare connection 3/8 in (9.52 mm)
- ③ Refrigerant tube joint (wide tube)  
Flare connection 3/4 in (19.05 mm)
- ④ Refrigerant tubing inlet
- ⑤ Power supply inlet

1342\_C\_S

## 1-5 Refrigerant Flow Diagram

Indoor Unit: XS3632

Outdoor Unit: C3632, CL3632



1345\_X\_S

## 1-6 Operating Range

- XS3632 / C3632

Temperature	Indoor Air Intake Temp.	Outdoor Air Intake Temp.
Maximum	95 °F DB / 71 °F WB	115 °F DB
Minimum	67 °F DB / 57 °F WB	67 °F DB

- XS3632 / CL3632

Temperature	Indoor Air Intake Temp.	Outdoor Air Intake Temp.
Maximum	95 °F DB / 71 °F WB	115 °F DB
Minimum	67 °F DB / 57 °F WB	0 °F DB



## 2. PROCESSES AND FUNCTIONS

2-1	Room Temperature Control .....	22
2-2	Freeze Prevention .....	23
2-3	Drain Pump Control .....	23
2-4	Outdoor Fan Speed Control .....	24

## 2-1 Room Temperature Control

The Unit adjusts room temperature by turning the outdoor unit's compressor ON and OFF. This process is controlled by the **thermostat** located in the remote control unit. The figures on this and the next pages show how each part of the system performs when the room temperature changes and the thermostat activates the compressor to start (**thermo ON**) or stop (**thermo OFF**). Fig. 1 shows about the cooling cycle.

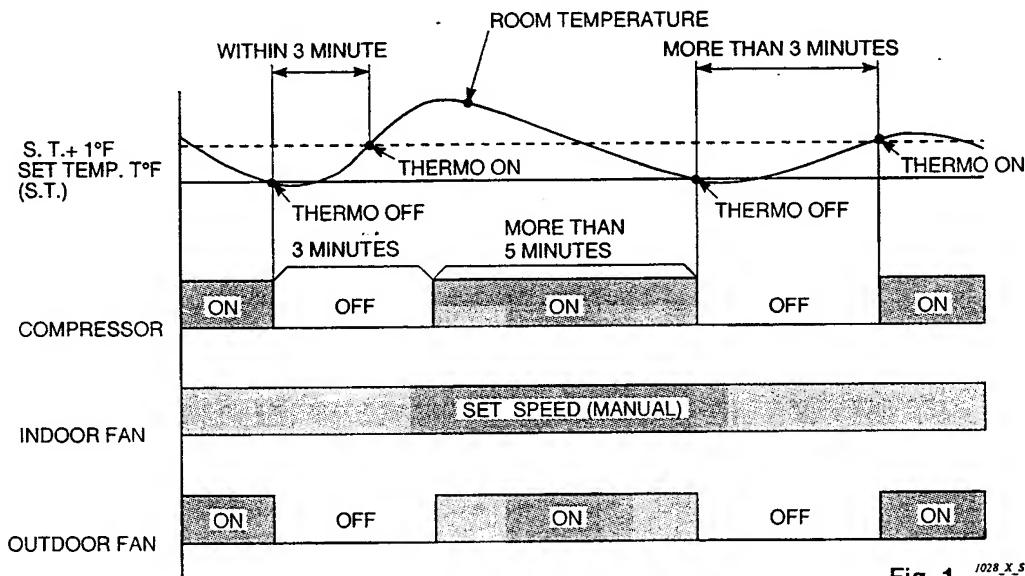


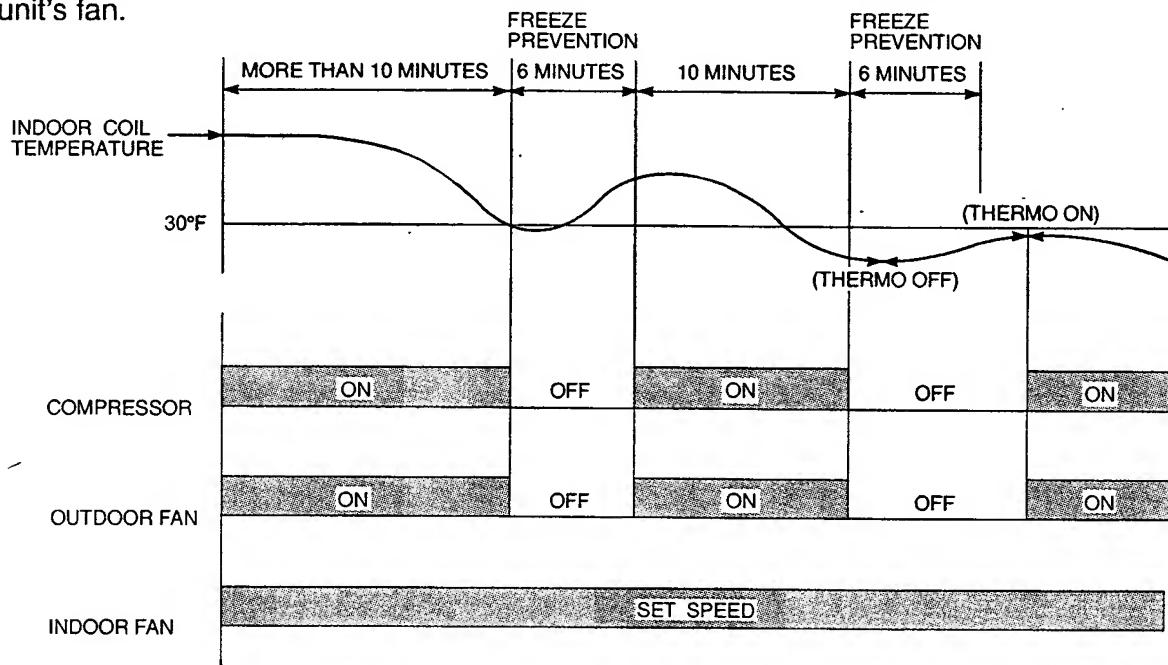
Fig. 1 1028\_X\_5

### Chart Summary and Explanations

- Once the compressor starts, it keeps running for 5 minutes.
- Once the compressor stops, it will not start running again for 3 minutes.
- If you change the operation mode during the cooling cycle, the control circuit stops the compressor for 3 minutes.
- For 5 minutes after the compressor is first turned on, and for 3 minutes after it is turned off, the compressor is not controlled by the room sensor.
- **Thermo ON:** When room temperature rises 1 °F above the set temperature T°, (T °+1 °F):  
Compressor → ON
- **Thermo OFF:** When the room temperature is equal to or below the set temperature T°:  
Compressor → OFF

## 2-2 Freeze Prevention

Freeze Prevention keeps the indoor heat exchange coil from freezing. Freezing reduces the efficiency of the unit, and frost buildup on the coil blocks cool air circulation from the indoor unit's fan.



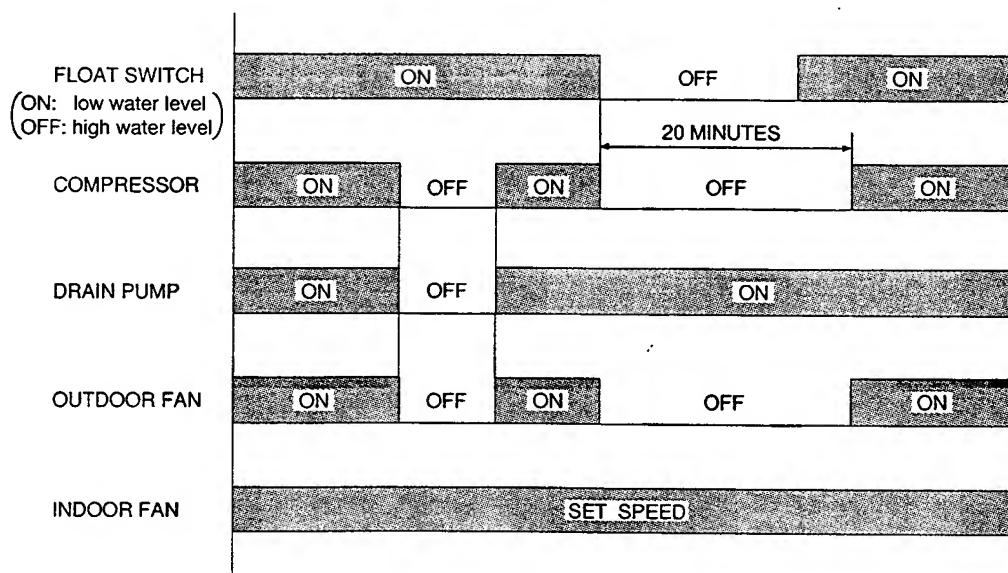
2

Fig. 2

1029\_X\_S

## 2-3 Drain Pump Control

Drain pump operates when compressor starts to operate or when Float Switch turns off.



0609\_X\_S

Fig. 3

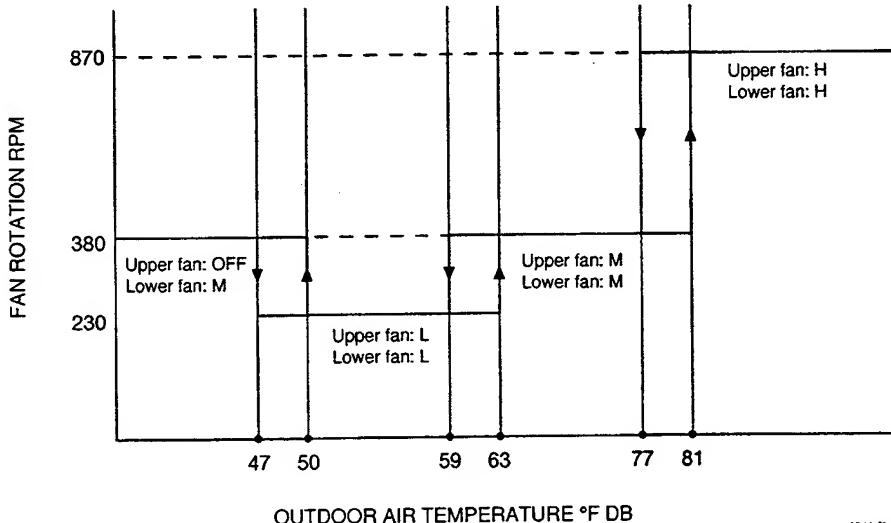
## 2-4 Outdoor Fan Speed Control

### (1) C3632 Type

- In low outdoor temperature, the outdoor fan is set automatically from HIGH to LOW to prevent the indoor heat exchanger from freezing.
- When the outdoor temperature falls below 78 °F, the outdoor fan is set from HIGH to LOW automatically. When the outdoor temperature rises to 82 °F, the outdoor fan is set from LOW to HIGH automatically.

### (2) CL3632 Type

- In low outdoor temperature, the outdoor fan is set automatically from HIGH to MED, LOW to prevent the indoor heat exchanger from freezing.
- When the outdoor temperature falls below 77 °F, the outdoor fan is set from HIGH to MED automatically. When the outdoor temperature rises to 81 °F, the outdoor fan is set from MED to HIGH automatically.
- When the outdoor temperature falls below 59 °F, the outdoor fan is set from MED to LOW automatically. When the outdoor temperature rises to 63 °F, the outdoor fan is set from LOW to MED automatically.
- When the outdoor temperature falls below 47 °F, the outdoor upper fan is set from LOW to OFF and Lower fan is set from LOW to MED automatically. When the outdoor temperature rises to 50 °F, the outdoor upper fan is set from OFF to LOW and Lower fan is set from MED to LOW automatically.



1344\_X\_5

Fig. 4

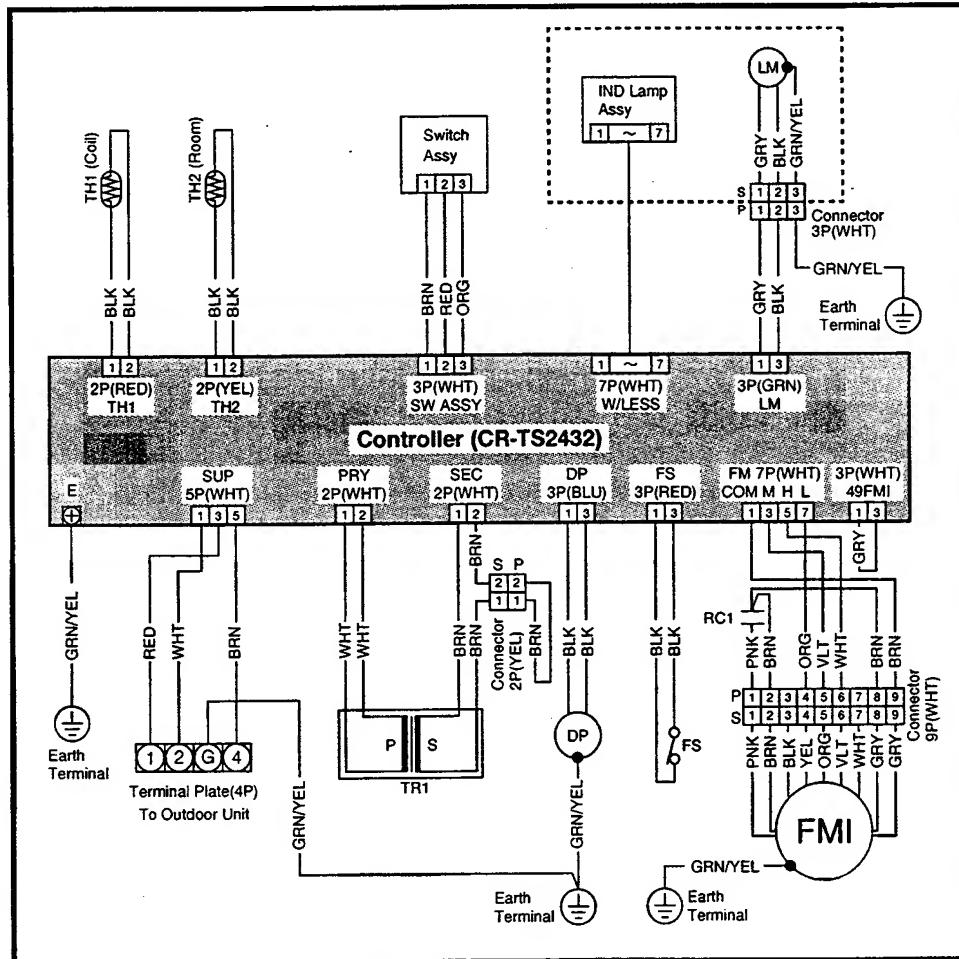
### 3. ELECTRICAL DATA

3-1	Indoor Unit (Electric Wiring Diagram, Schematic Diagram) .....	26
3-2	Outdoor Unit (Electric Wiring Diagram, Schematic Diagram) .....	28

## 3-1 Indoor Unit

① XS3632

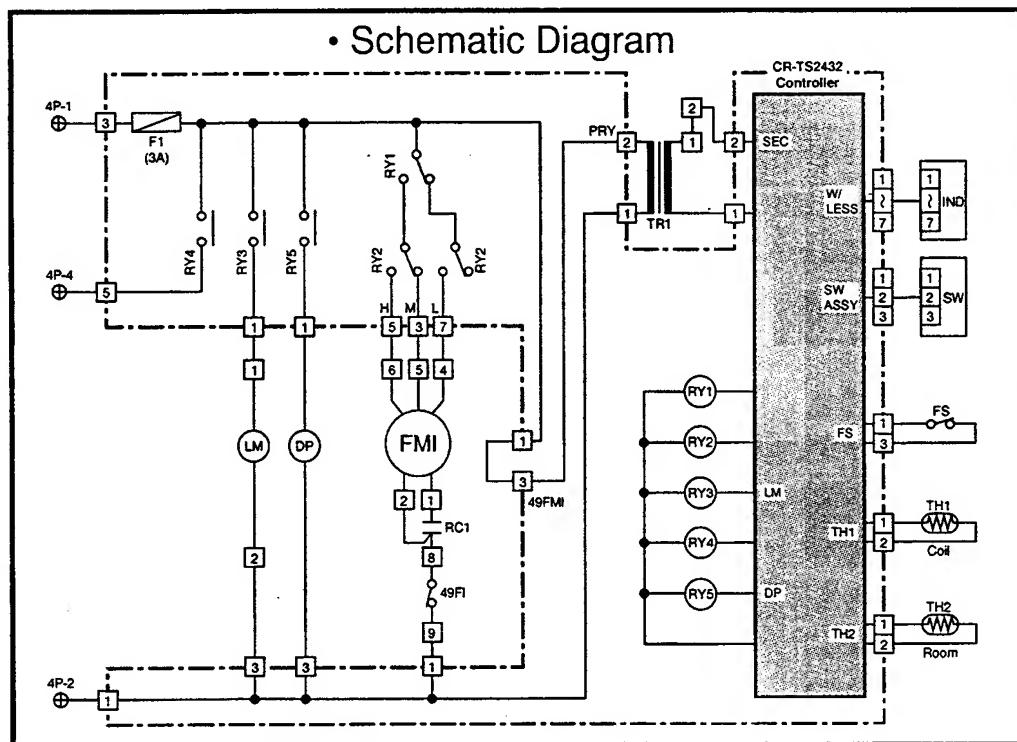
## • Electric Wiring Diagram



⑧ 854-2-5268-578-00-0 (XS3632)

## 3-1 Indoor Unit

## ① XS3632



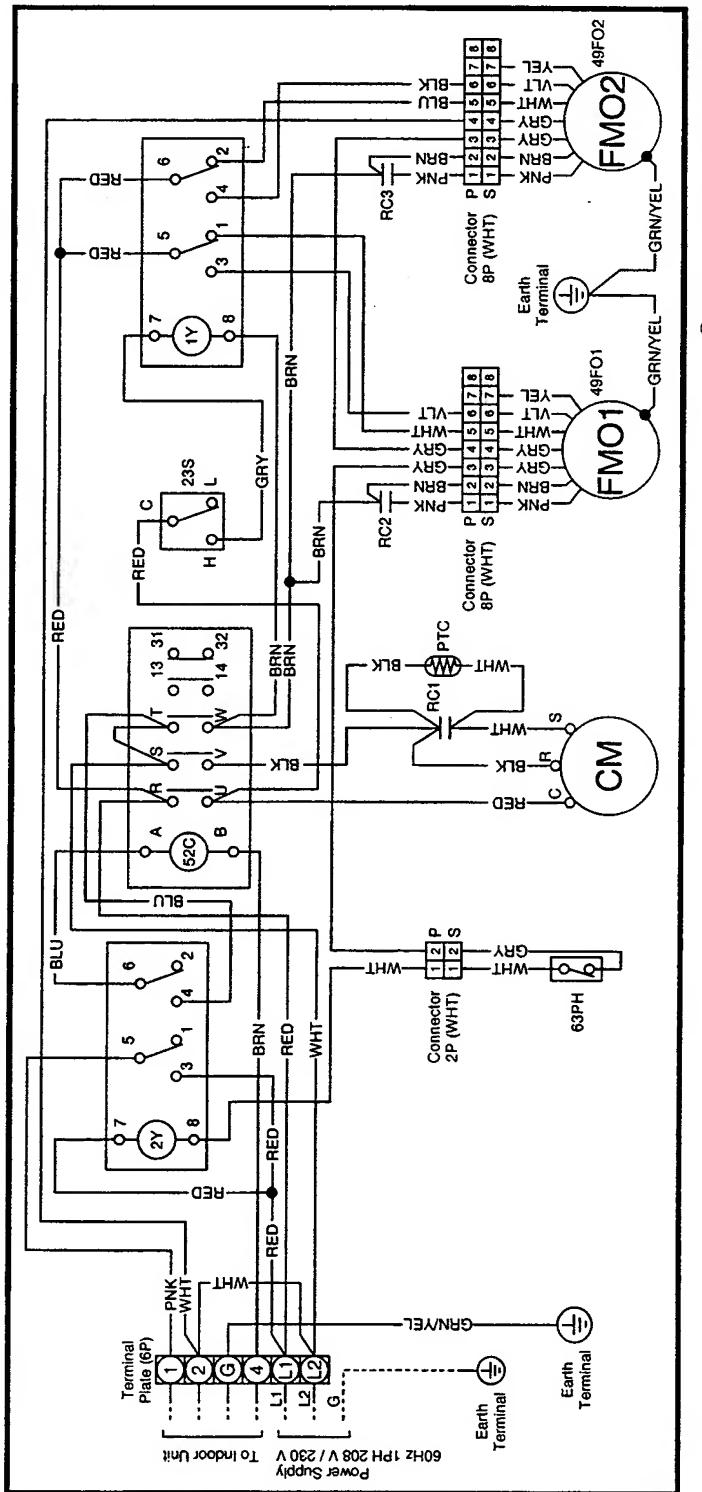
Symbols	Description	Symbols	Description
FMI	Indoor Fan Motor	TH1	Thermistor (Indoor Coil)
49FI	Indoor Motor Thermal Protector	TH2	Room Thermistor
RC1	Running Capacitor	CR-TS2432	Indoor Controller
F1	Fuse	IND	Indicator Lamp Assy
DP	Drain Pump	SW	Switch Assy
LM	Auto Louver Motor	⊕	Terminal Plate
TR1	Power Transformer	□	Connector
RY1-RY5	Auxiliary Relay	⊕	Terminal
FS	Float Switch		

(S) 854-2-5268-578-00-0 (XS3632)

## 3-2 Outdoor Unit

① C3632

## • Electric Wiring Diagram

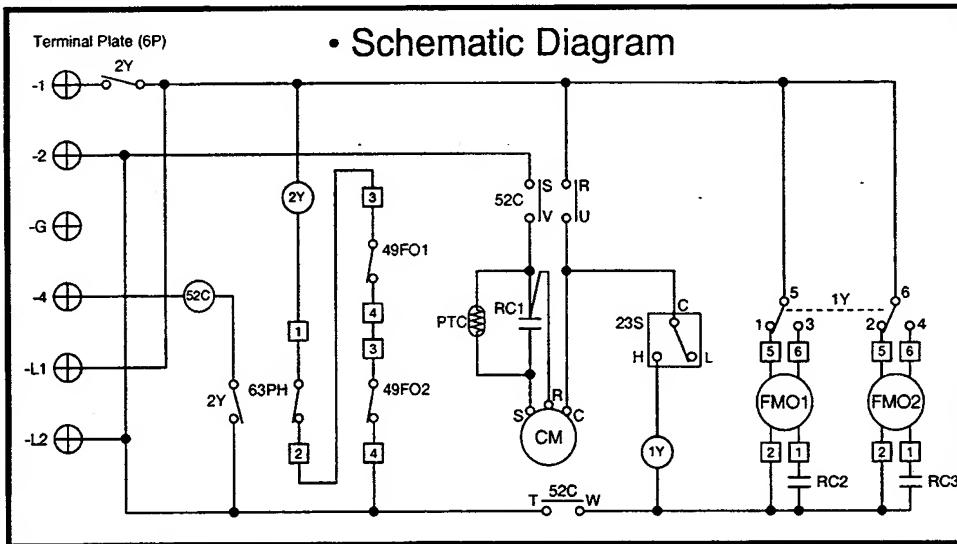


W 854-2-5268-620-00-0 (C3632)

### 3-2    **Outdoor Unit**

① C3632

- Schematic Diagram



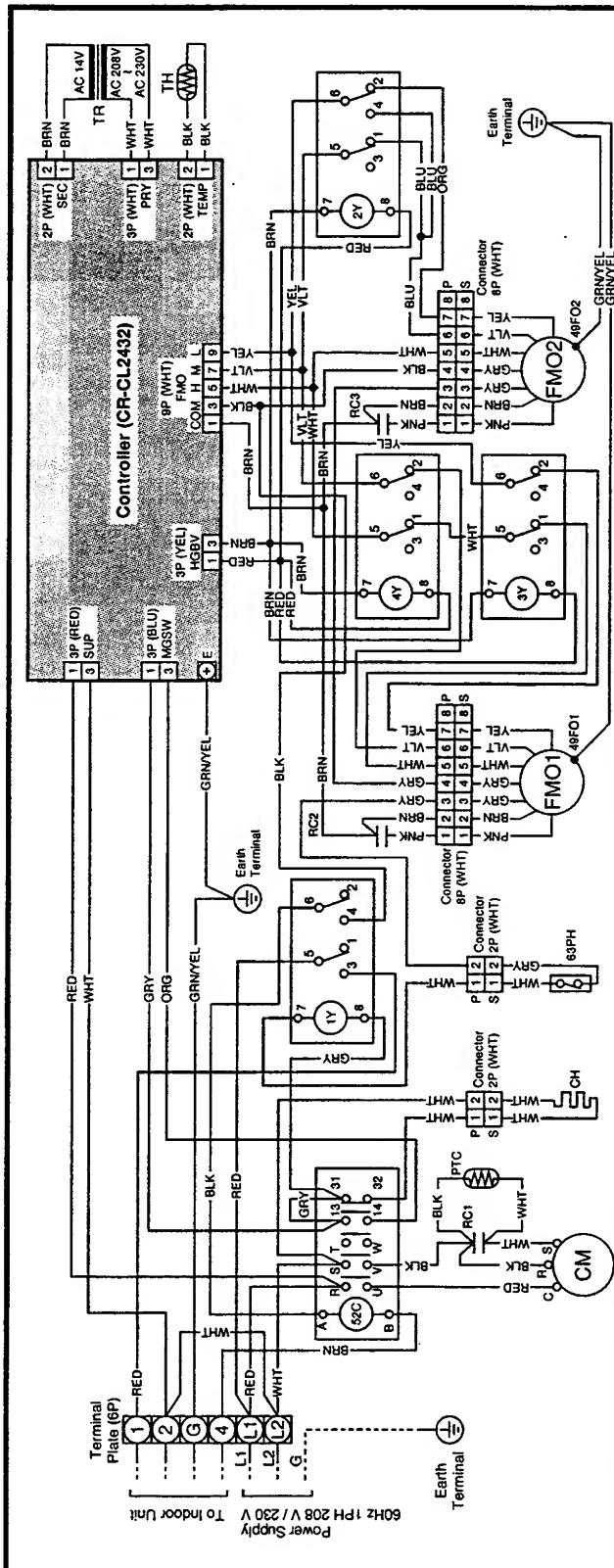
Symbols	Description
CM	Compressor Motor
FMO1, 2	Outdoor Fan Motor
49FO1, 2	Outdoor Fan Motor Thermal Protector
52C	Compressor Motor Magnetic Contactor
63PH	High Pressure Switch
23S	Fan Speedcontrol Thermostat
RC1, 2, 3	Running Capacitor
PTC	PTC Thermistor
1Y, 2Y	Auxiliary Relay
<input type="checkbox"/>	Connector
<input checked="" type="checkbox"/>	Terminal Plate

⑤ 854-2-5268-620-00-0 (C3632)

### 3-2      **Outdoor Unit**

② CL3632

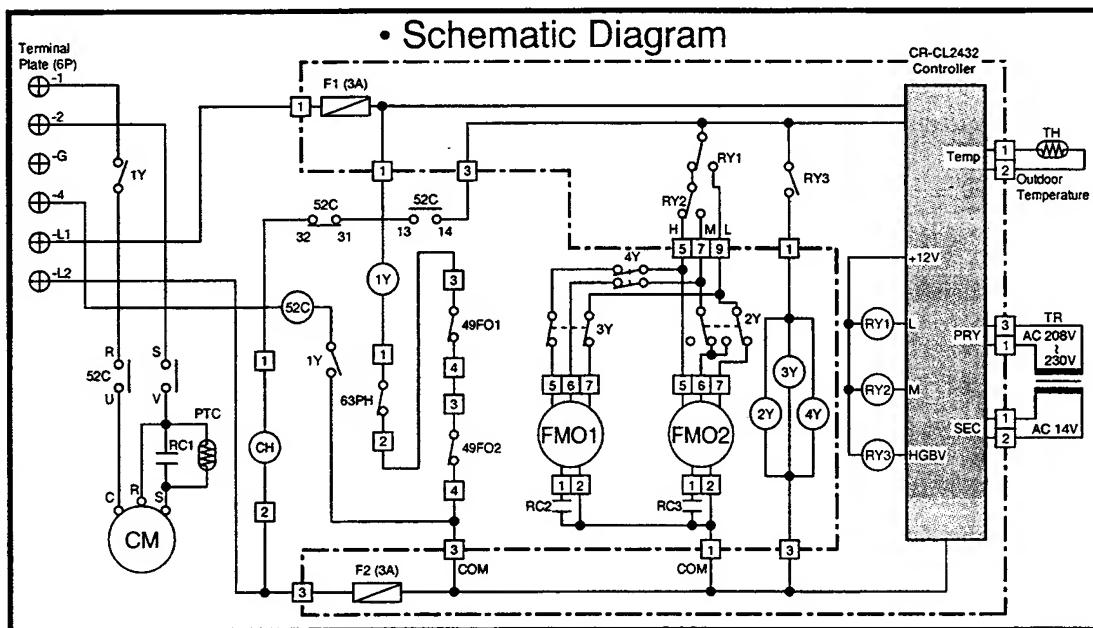
- Electric Wiring Diagram



W 854-2-5268-619-00-1 (CL3632)

## 3-2 Outdoor Unit

## ② CL3632



Symbols	Description	Symbols	Description
CM	Compressor Motor	F1, 2	Fuse
CH	Crankcase Heater	63PH	High Pressure Switch
FMO1, 2	Outdoor Fan Motor	⊕	Terminal Plate
49FO1, 2	Outdoor Fan Motor Thermal Protector	□	Connector
52C	Compressor Motor Magnetic Contactor	⊕	Terminal
PTC	PTC Thermistor		
TR	Power Transformer		
TH	Thermistor (Outdoor Temperature)		
RC1, 2, 3	Running Capacitor		
RY1, 2, 3	Auxiliary Relay		
1Y~4Y	Auxiliary Relay		
CR-CL2432	Outdoor Controller		

3

⑧ 854-2-5268-619-00-1 (CL3632)



## 4. SERVICE PROCEDURES

4-1	Troubleshooting .....	34
(1)	Check before and after Troubleshooting .....	34
(2)	Air Conditioner does not Operate .....	35
(3)	Outdoor Unit does not Run .....	39
(4)	Indoor Unit does not Run .....	41
(5)	Some Part does not Operate .....	41
(6)	Outdoor Fan does not Run .....	42
(7)	Outdoor Fan Speed is not Switched from High to Low even when the Outdoor Temperature Falls below 78 °F (C3632 Type) .....	42
(8)	Outdoor Fan Speed is not Switched from High to Med even when the Outdoor Temperature Falls below 77 °F Outdoor Fan Speed is not Switched from Med to Low even when the Outdoor Temperature Falls below 59 °F (CL3632 Type) .....	42
(9)	Outdoor Fan does not Run for CL3632 .....	43
(10)	Compressor does not Run .....	43
(11)	Poor Cooling .....	44
(12)	Excessive Cooling .....	44
4-2	A Sensor is Defective .....	45
4-3	Operation of Major Electrical Parts .....	45
4-4	Checking the Electrical Components .....	46
(1)	Measurement of Insulation Resistance .....	46
(2)	Checking the Protective Devices .....	47
(3)	Checking the Electrical Parts .....	48
(4)	Thermistor Characteristic Curve .....	49

## 4-1 Troubleshooting

### (1) Check before and after Troubleshooting

Many problems may happen because of wiring or power supply problems, so you should check these areas first. Problems here can cause false results in some of the other tests, and so should be corrected first.

#### ① Check power supply wiring

##### (a) Single-phase

- Check that power supply wires are correctly connected to terminal No. 1 through No. 4 on the 4P terminal plate in the indoor unit and L1 and L2 on the 6P terminal in the outdoor unit.

#### ② Check inter-unit wiring

- Check that inter-unit control wiring (AC 230 - 208 V Line voltage) is correctly connected between the indoor unit and outdoor unit.

##### Single-phase outdoor unit

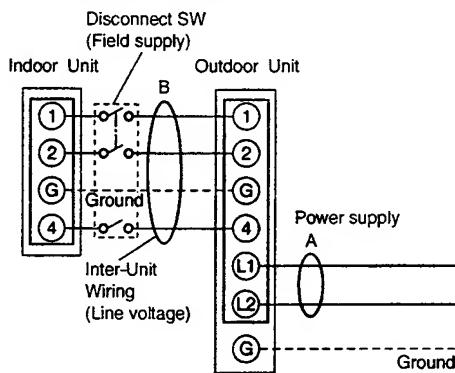


Fig. 5

1089\_M\_1

#### ③ Check power supply

- Check that voltage is within the specified range ( $\pm 10\%$  of the rating).
- Check that power is being supplied.



**WARNING**

If the following troubleshooting must be done with power being supplied, be careful not to touch any uninsulated live part that can cause ELECTRIC SHOCK.

#### ④ Check the lead wires and connectors in indoor and outdoor units.

- Check that the sheath of lead wires is not damaged.
- Check that the lead wires are firmly connected at the terminal plate.
- Check that the wiring is correct.

#### ⑤ Reference

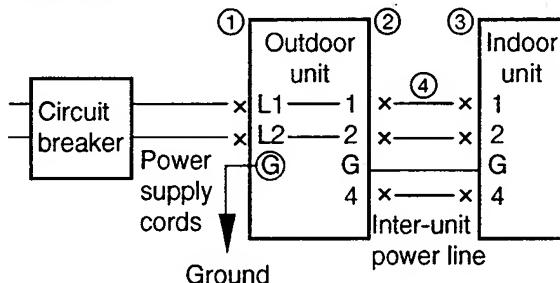
- Condition of general cooling operation (Thermo. ON)  
SWEEP ..... ON  
Indoor fan speed .... HIGH

**(2) Air Conditioner does not Operate****① Circuit breaker trips (or fuse blows).****(a) When the circuit breaker is set to ON, it is tripped soon.**

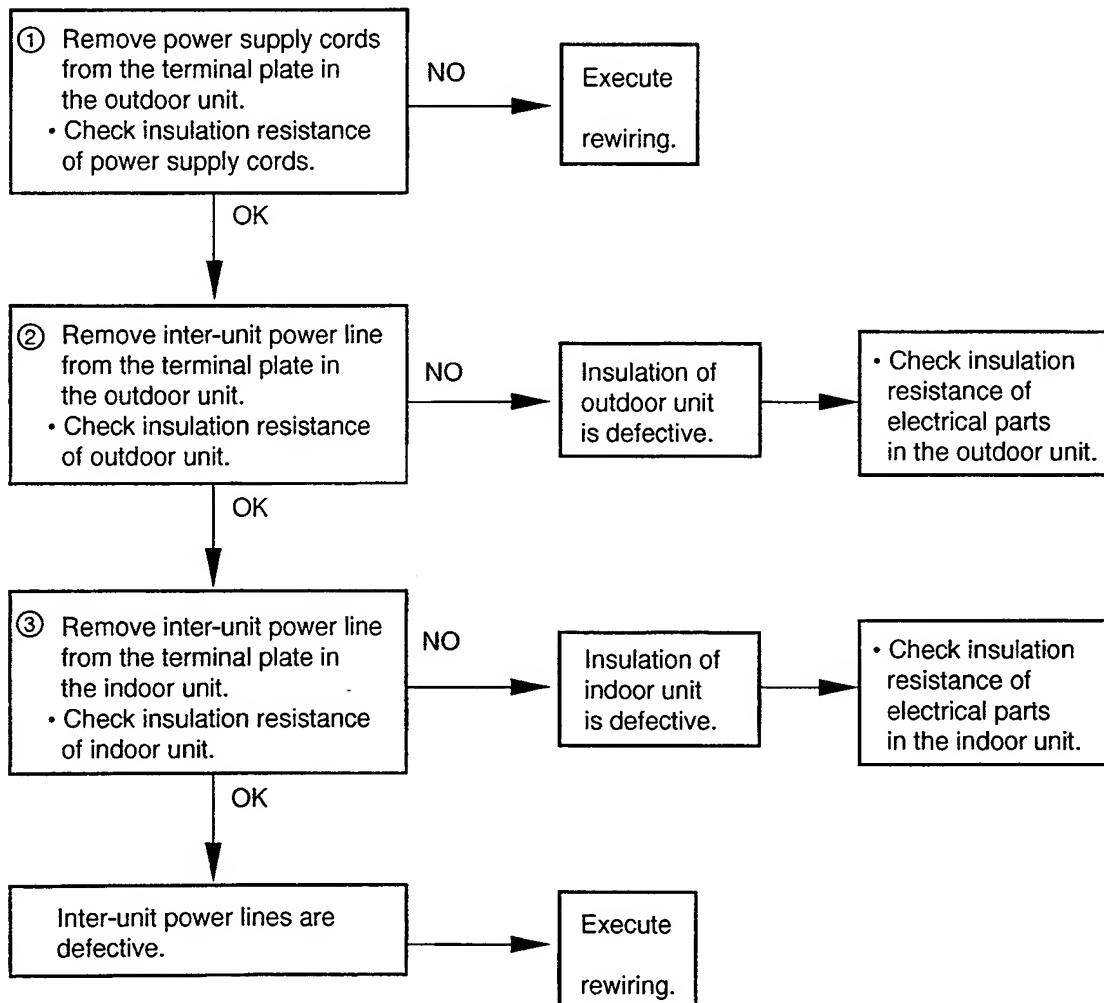
- There is a possibility of ground fault.
- Check insulation resistance.

If resistance value is 1 MΩ or less, it is a defect of insulation.

(Example)

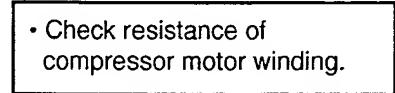
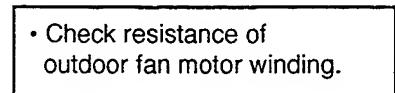
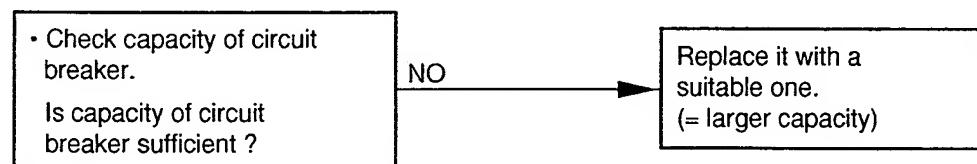


\*Set the circuit breaker to OFF.



## (b) Circuit breaker trips in several minutes after turning the air conditioner on.

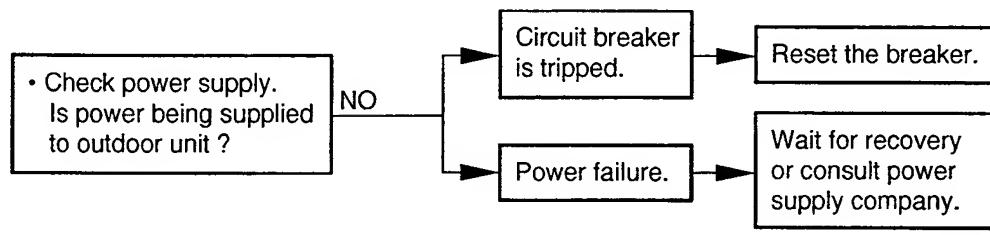
- There is a possibility of short circuit.



0614\_X\_S

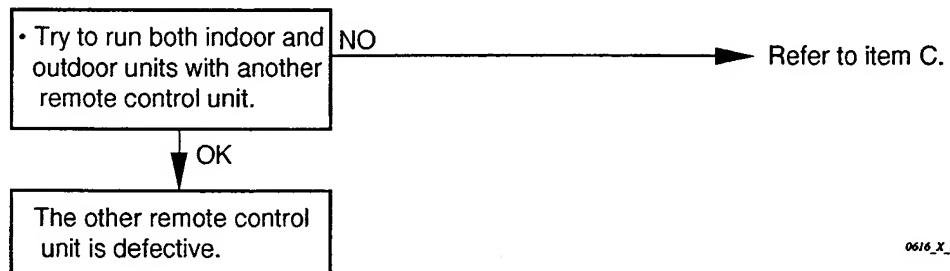
## (2) Neither indoor unit nor outdoor unit runs.

## A. Power is not supplied



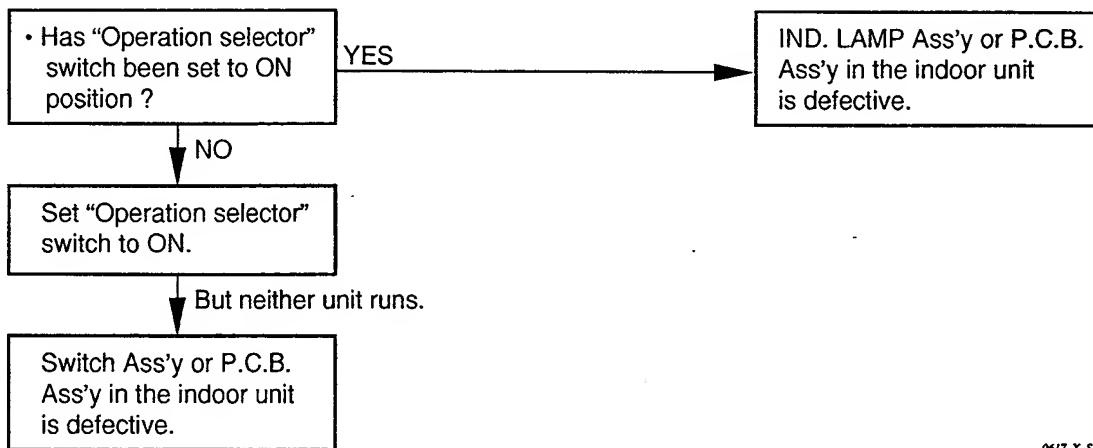
0615\_X\_S

## B. Check remote control unit.



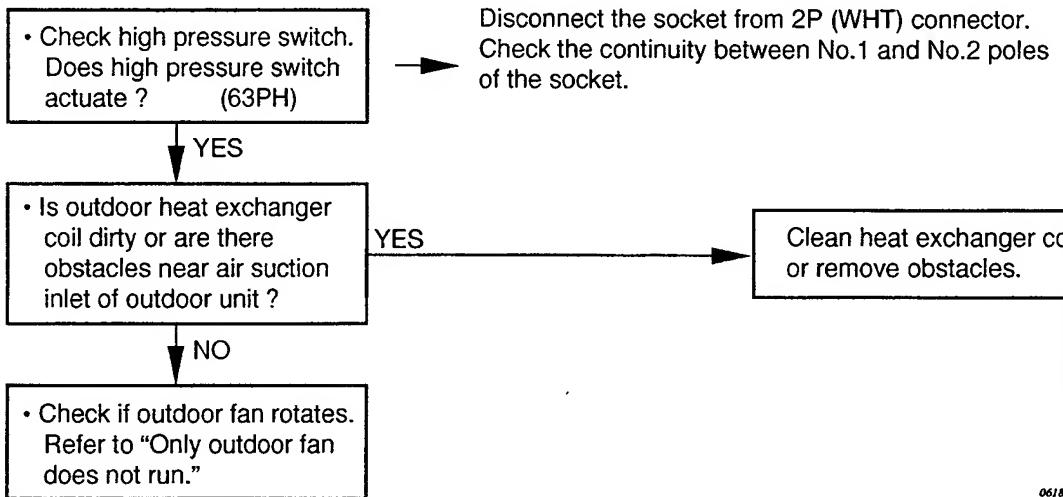
0616\_X\_S

## C. Check "Operation selector" switch in the indoor unit.



## D. Check compressor motor protectors.

## (a) High pressure switch (63PH)



## E. Transformer in indoor unit.

- Check resistance of transformer winding. (TR1)

1033\_X\_S

## F. Check auxiliary relay. (1Y or 2Y)

- Check coil resistance of auxiliary relay.  
(1Y or 2Y)

0620\_X\_S

## G. Check indoor fan motor thermal protector (49FMI)

- Disconnect the socket from 9P (WHT) connector.

- Check the continuity between No. 8 and No.9 poles of the 9P socket.

↓ No continuity.

The thermal protector (49FMI) is operated.

- Check fan rotation. Rotate the fan gently once or twice by hand.

↓ OK

- Check fan motor capacitor.

Fan cannot be rotated.

- Check fan casing for foreign matter on the inside.

Remove foreign matter or repair.

- Fan motor burnout or foreign matter in bearing.

Repair or replace.

0621\_X\_S

## H. Check fuse on the P.C.B. Ass'y in the indoor unit.

- Check fuse on the P.C.B. Ass'y in the indoor unit for continuity.

↓ When the fuse blows.

- Check transformer. (TR1)

↓ OK

- Check resistance of indoor fan motor winding.  
(FMI)

↓ OK

- Check resistance of louver motor winding.  
(LM)

↓ OK

- Check resistance of drain pump winding. (DP)

↓ OK

- Check coil of compressor motor magnetic contactor.  
(52C)

↓ OK

- P.C.B. Ass'y is defective.

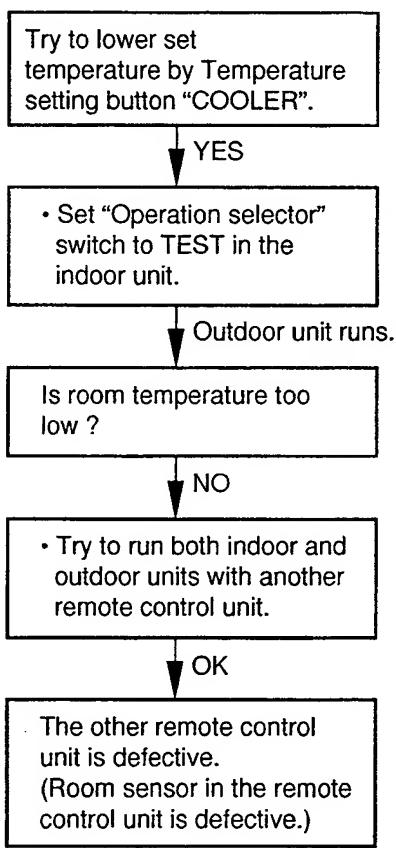
1034\_X\_S

**(3) Outdoor Unit does not Run.**

A. Check COOL / FAN selector switch in the remote control unit.



B. Check set temperature.



## C. Check compressor motor magnetic contactor.

- Check coil resistance of compressor motor magnetic contactor. (52C)

1035\_X\_S

## D. Check indoor unit P.C.B.

## E. Check outdoor unit P.C.B. (CL3632 Type)

- Check P.C.B. Ass'y.

- Check P.C.B. Ass'y.

- Check voltage between terminals No.2 and No.4 at terminal plate.

- Check voltage between terminals L1 and L2 at terminal plate.

No voltage appears.

No voltage appears.

P.C.B. Ass'y is defective.

P.C.B. Ass'y is defective.

0628\_X\_S

1036\_X\_S

## F. Check float switch.

- Refer to "2-3 Drain Pump Control"

Is drainage prevented from flowing ?

NO (Wait for 20 minutes.)

YES

- Check drain hose.

- Check float switch (FS).

0629\_X\_S

**(4) Indoor Unit does not Run.**

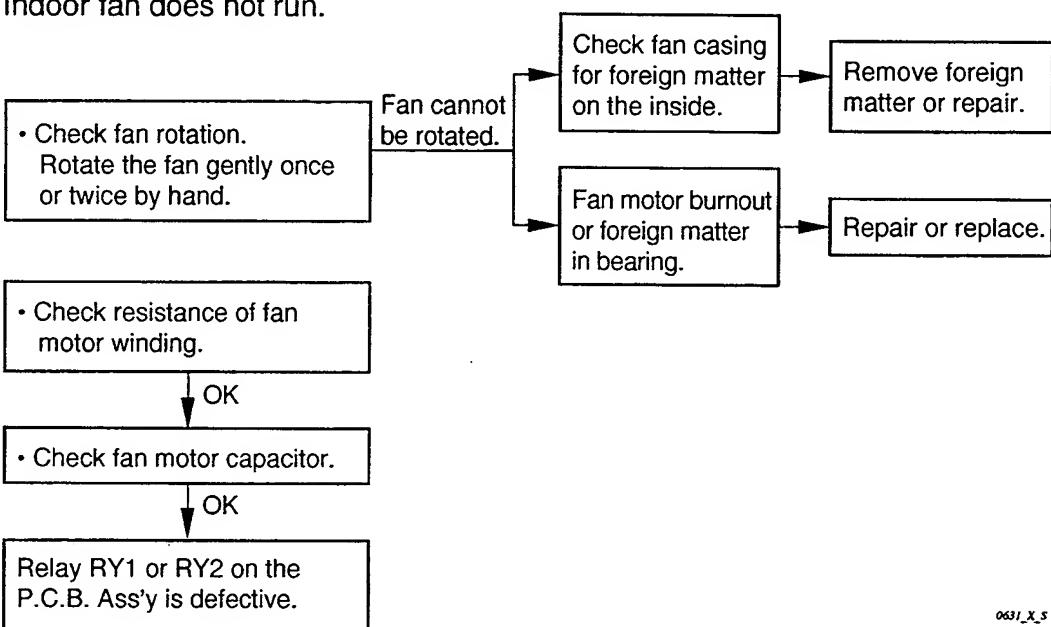
(Indoor fan and louver motor do not run.)

P.C.B. Ass'y is defective.

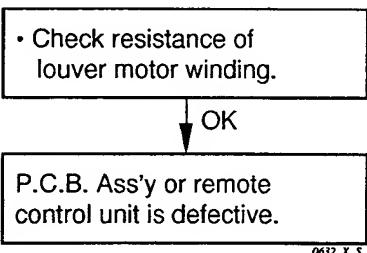
0630\_X\_5

**(5) Some Part does not Operate.**

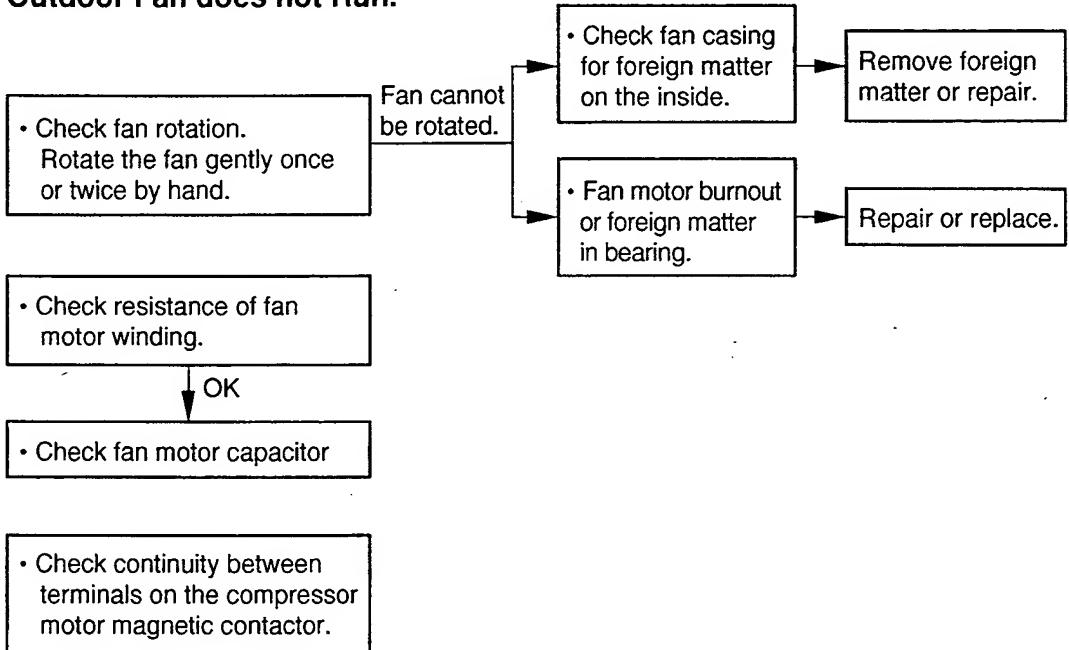
## A. Indoor fan does not run.



## B. Louver motor does not run.



## (6) Outdoor Fan does not Run.



0633\_X\_S

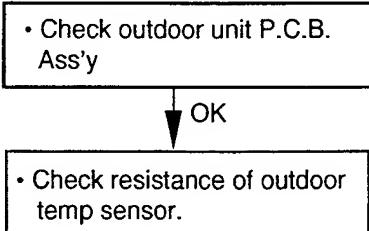
## (7) Outdoor Fan Speed is not Switched from High to Low even when the Outdoor Temperature Falls below 78 °F. (C3632 Type)

- Check the thermostat (23S).

1037\_X\_S

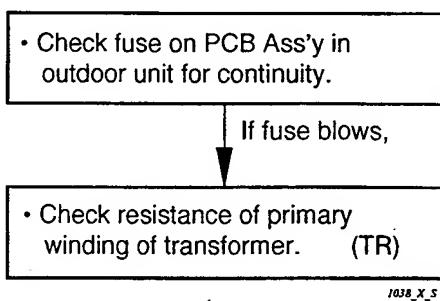
## (8) Outdoor Fan Speed is not Switched from High to Med even when the Outdoor Temperature Falls below 77 °F.

Outdoor Fan Speed is not Switched from Med to Low even when the Outdoor Temperature Falls below 59 °F. (CL3632 Type)

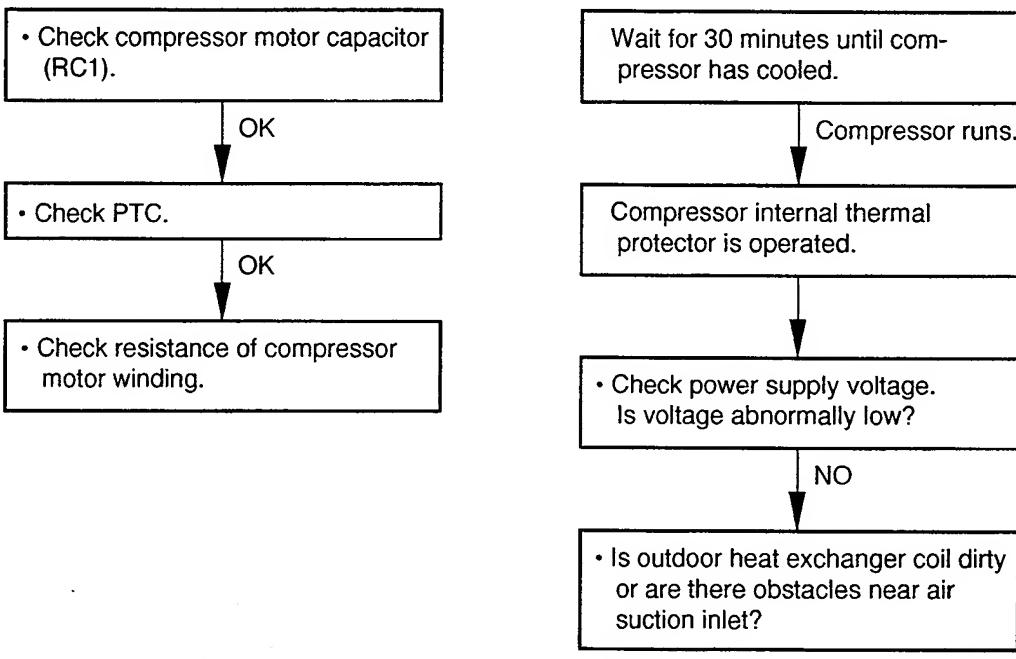


0722\_X\_S

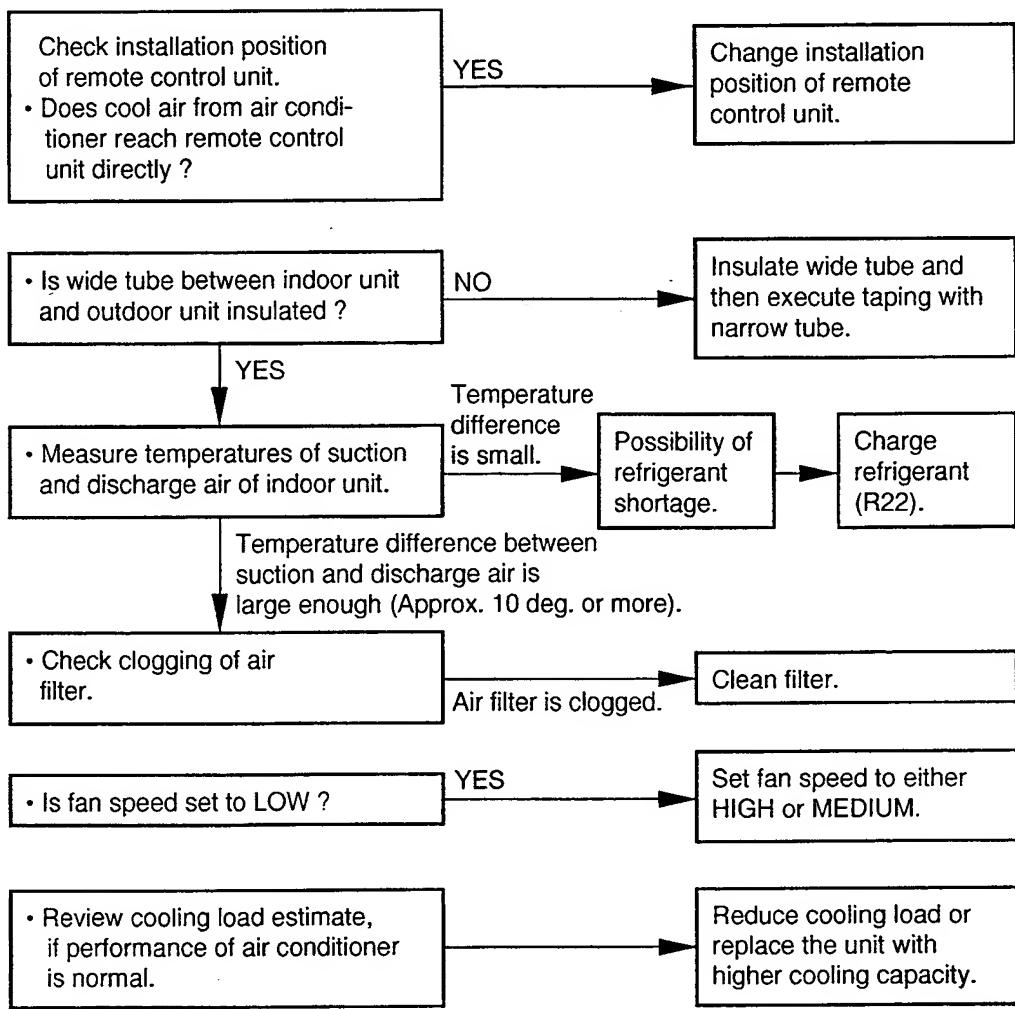
## (9) Outdoor Fan does not Run for CL3632.



## (10) Compressor does not Run.

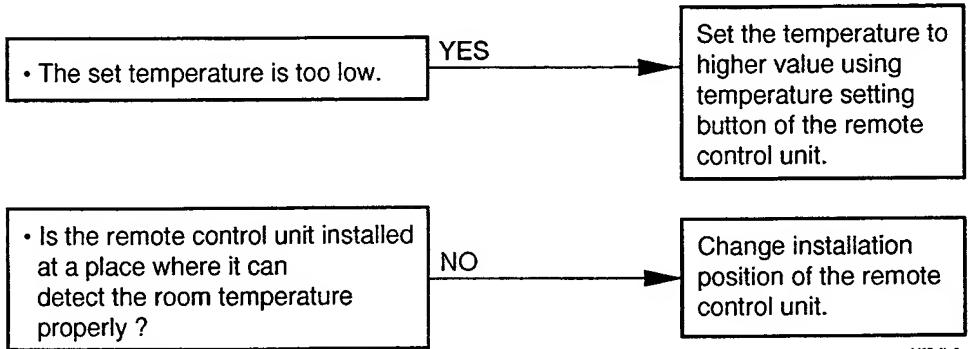


## (11) Poor Cooling



4

## (12) Excessive Cooling.



## 4-2 A Sensor is Defective.

## ① Indoor (heat exchanger) coil temp. Sensor is defective.

(a) Open (=No continuity in sensor)

Compressor and outdoor fan repeat ON for 10 minutes and OFF for 6 minutes when sensor opens.

(b) Short

"Freeze Prevention" does not operate when dehumidified water is frozen on the indoor coil.

## ② Room temp. Sensor (in the remote control unit) is defective.

(a) Open (=No continuity in sensor)

Neither outdoor fan nor compressor runs.

(b) Short

Outdoor fan and compressor do not stop. — Excessive cooling.

## 4-3 Operation of Major Electrical Parts

Operation Mode (Function)		Operation	Indoor unit and Remote Control unit					Oudoor unit		
			Indicator lamps					Fan	Fan	Compressor
			Room Temp.	Cool	Timer	Night setback Energy saver	Sweep			
Cool -ing	Manual	Thermo.ON	○	○				○	○	○
		Thermo.OFF	○	○				○		
	Night setback	Thermo.ON	○	○		○		○	○	○
		Thermo.OFF	○	○		○				
	Timaer (set)	ON Timer			○					
		OFF Timer	○	○	○			○	○	○
	Freeze prevention		○	○				○		
Fan			○					○		
Flap	Sweep	Cool	○	○*		○*		○	○*	○*
		Fan	○					○		
	Stop	Cool	○	○*		○*		○	○*	○*
		Fan	○					○		

NOTE O\* Refer to Cooling Mode.

## 4-4 Checking the Electrical Components

### (1) Measurement of Insulation Resistance

- The electrical insulation is acceptable when the resistance exceeds  $1 \text{ M}\Omega$ .

#### ① Power Supply Wires

Clamp the earthed wire of the Power Supply wires with a lead clip of the insulation resistance tester and measure the resistance by placing a probe on either of the power wires. (Fig. 6)

Then measure the resistance between the earthed wire and the other power wires. (Fig. 6)

#### ② Indoor Unit

Clamp an aluminum plate fin or copper tube with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on the terminal plate (Fig. 7)

#### ③ Outdoor Unit

Measure the resistance by placing a probe on the terminal plate in the same manner as explained above ②. (Fig. 7)

#### ④ Measurement of Insulation Resistance for Electrical parts

- Disconnect the connector of the desired electric part from terminal plate, P.C.B. Ass'y, etc. (Fig. 8)
- Similarly, disconnect the lead wires from compressor, capacitor, etc. (Fig. 9)
- Measure the resistance in the same manner as illustrated on the right.

Refer to Electrical Wiring Diagram.

#### NOTE

If the probe does not enter the hole because the hole is too narrow, use a probe with a thinner pin.

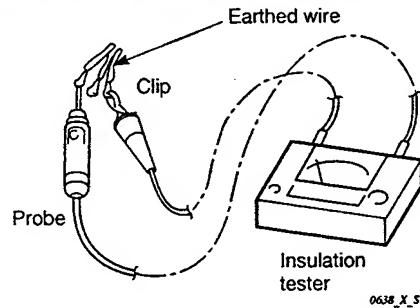


Fig. 6

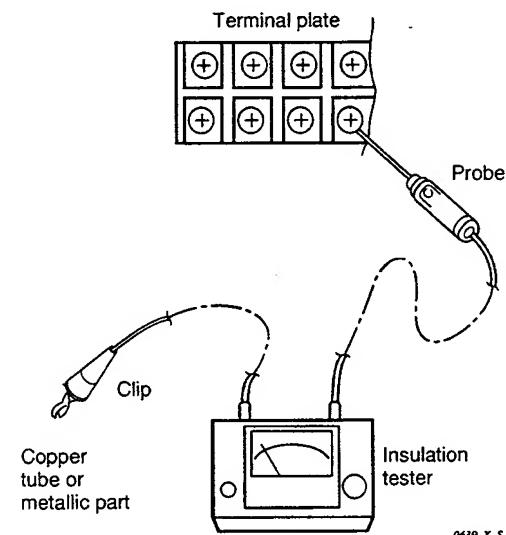


Fig. 7

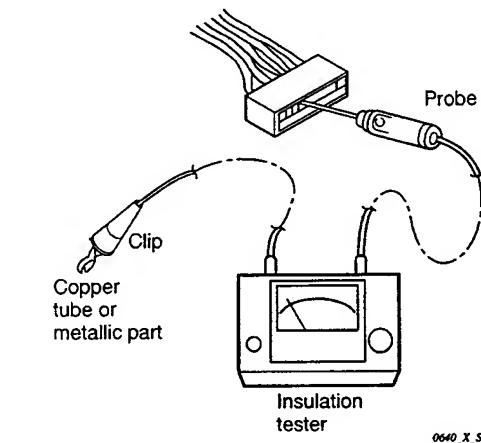


Fig. 8

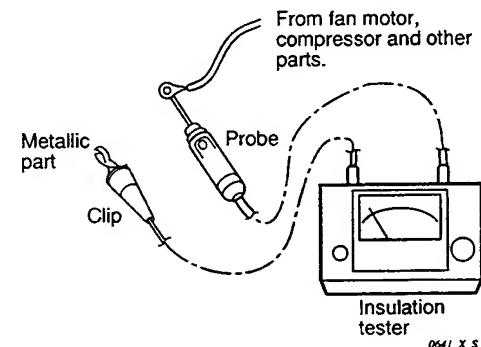


Fig. 9

## (2) Checking the Protective Devices

- Disconnect the connector, which consists of P (plug) and S (socket) when you want to check the protective device.
- Then check continuity among plug's (and/or socket's) terminal as in **Fig. 10**.
- Normality of the protective device can be judged by the following table.  
The Protective Device is proved normal if there is a continuity between terminals.

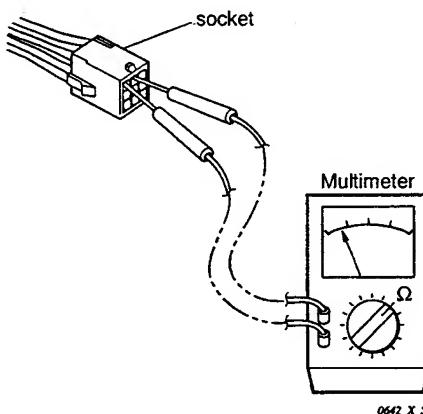


Fig. 10

- ① **Indoor fan motor thermal protector (49FI) . . . . . Indoor unit**
  - Disconnect the connector which leads to the indoor fan motor (FMI).
  - Check the socket's terminals.
- ② **Compressor motor thermal protector . . . . . Outdoor unit**
  - Disconnect the wires from terminals of compressor.
  - Check the terminals of compressor.
- ③ **Outdoor fan motor thermal protector (49FO) . . . . . Outdoor unit**
  - Disconnect both the connector which leads to the outdoor fan motor (FMO).
  - Check socket's terminal.

## (3) Checking the Electrical Parts

① **Power transformer (TR1) .....** **Indoor unit** \*Measure the coil resistance.

- Primary 230-208 V ; Measure the resistance between two WHT lead wire terminals of socket connected to power transformer.
- Secondary 10.6 V ; Measure the resistance between two BRN lead wires.  
Refer to "1-3-(A) Other component specifications".

② **Power transformer (TR) .....** **Outdoor unit** \*Measure the coil resistance.

- Primary 230-208 V ; Measure the resistance between two WHT lead wire terminals of socket jointed to power transformer.
- Secondary 14 V ; Measure the resistance between two BRN lead wires.  
Refer to "1-3-(B) Other component specifications".

③ **Indoor fan motor (FMI) .....** **Indoor unit** \*Measure the coil resistance.

- Measure the resistance between each terminal of the socket connected to the indoor fan motor.  
Refer to "1-2-(A) Major component specifications".

④ **Outdoor fan motor (FMO) .....** **Outdoor unit** \*Measure the coil resistance.

- Measure the resistance in the same manner as explained above ③.  
Refer to "1-2-(B) Major component specifications".

⑤ **Motor capacitor .....** **Both in indoor and outdoor unit**

- Remove the lead wires from the capacitor terminals, and then place a probe on the capacitor terminals as shown in **Fig. 11**. Observe the deflection of the pointer, setting the resistance measuring range of the multimeter to the maximum value.
- The capacitor is "good" if the pointer bounces to a great extent and then gradually returns to its original position.

**NOTE**

The range of deflection and the deflection time differ according to the capacity of the capacitor.

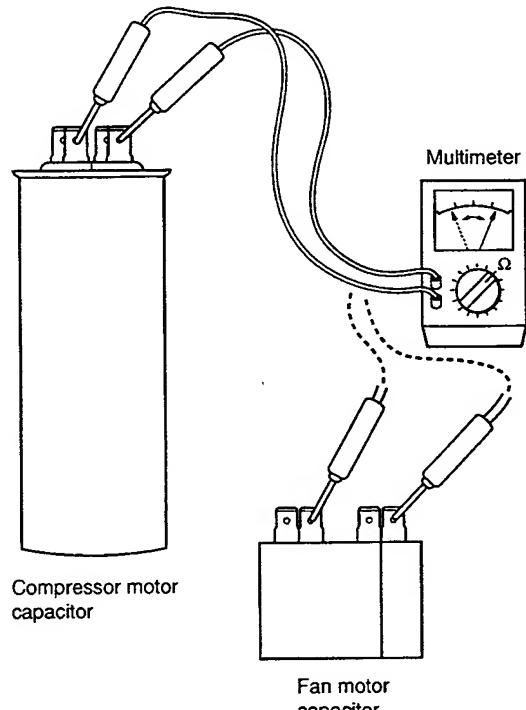


Fig. 11

## ⑥ Continuity of fuse on P.C.B. Ass'y

- Check for continuity using a multimeter as shown in Fig. 12.

### NOTE

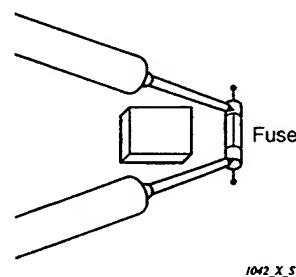
#### Method Used to Replace Fuse on PCB Ass'y

- Remove the PCB Ass'y from the electrical component box.
- Remove the fuse from PCB Ass'y using pliers while heating the soldered leads on the back side of the PCB Ass'y with a soldering iron (30W or 60W). (Fig. 13)
- For replacement, insert a fuse of the same rating to the intended position and solder it. (Allow time to radiate heat during soldering so that the fuse does not melt.)



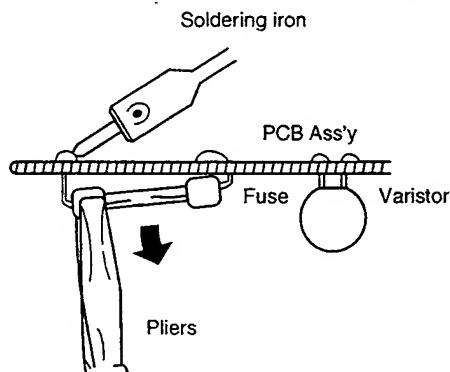
**CAUTION**

When replacing the fuse, be sure not to break down the varistor.



1042\_X\_S

Fig. 12

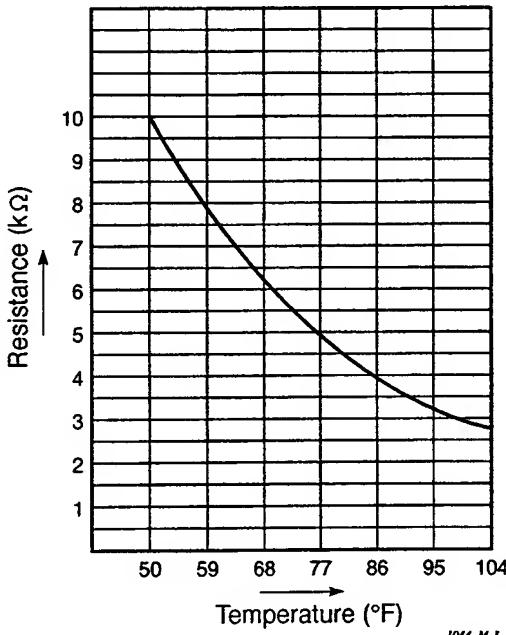


1043\_X\_S

Fig. 13

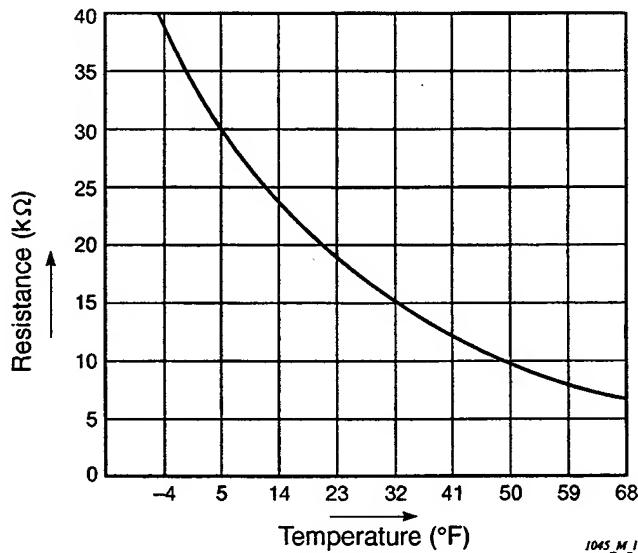
## (4) Thermistor Characteristic Curve

### ① Room temp. sensor (KTEC-35)



1044\_M\_1

### ① Coil sensor (PBC-41E)



1045\_M\_1

4

SANYO FISHER Service Company  
CENTRAL REGION

1165 Allgood Road, Suite 22  
Marietta, GA 30062  
Phone: (770) 509-5230  
Fax: (770) 579-2860

Jan. / '99

Printed in U.S.A.